

EtherFast Series

10/100 Network In a Box



**Use this guide to install this
Linksys product:**

FENSK05

EtherFast 10/100 Network In a Box

User Guide

LINKSYS

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FCC STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment or device
- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance

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Introduction

If you've wanted to connect your computers together to share files, applications, CD-ROM drives, hard disks, printers, and more, look no further! The 10/100 Network In a Box comes with everything you need to get up and running in just a few minutes. Just plug in the cards, attach the provided 100BaseTX cables, install the software drivers -- and go! Your data will move at blistering speeds! Best of all, you can seamlessly integrate your old 10Mbps hardware with no hassles!

Fast Ethernet is a relatively new standard of networking built specifically for speed-intensive network applications like video-conferencing, multimedia development, imaging, and complex databases. Capable of sending and receiving data at **100 megabits-per-second** over 4 wires in half duplex mode, and 200Mbps in full duplex, Fast Ethernet technology is at least 10 times faster than traditional 10BaseT networks.

Built to run with the fastest video, publishing, graphics, and database applications, the **EtherFast 10/100 LAN Card** is a high performance network adapter for desktop computers with 32-bit **PCI** expansion slots. Boasting an incredible maximum data throughput of 200 megabits per second in full duplex mode (100Mbps in half duplex), the EtherFast card is ready to run with both 10BaseT and 100BaseTX networks right out of the box – the card's 10/100 combo port automatically detects your network's maximum speed and adjusts itself accordingly.

The 10/100 LAN Card from Linksys also features **Wake-On-LAN** event management. If your PCI motherboard has built-in WOL support, you'll be able to utilize this unique management feature. You can remotely

turn on any computer with a WOL network card to perform after-hours tasks or to access files. The ultimate in managed 10/100 networking is yours! If you don't have WOL support on your motherboard or you have no need for it, don't worry -- your EtherFast 10/100 LAN Card will operate normally anyway.

The 10/100 Fast Ethernet Network In a Box also includes an **EtherFast 10/100 Auto-Sensing 5-Port Workgroup Hub**. The hub features five 10BaseT/100BaseTX RJ-45 ports that allow you to network up to four computers right now. Each port automatically detects and negotiates 10Mbps and 100Mbps connections. As your network grows, you can uplink the hub to other EtherFast hubs. The 10/100 Auto-Sensing 5-Port Workgroup Hub includes a switched distance extender uplink port that is capable of sending data up to 100 meters over a 100BaseTX connection. As long as the other four ports on the hub are running at 100Mbps, the uplink port will go **100 meters** (328 feet). If your connections are not all running at 100Mbps, the uplink distance to another 100BaseTX hub will become **5 meters** (16.4 feet). See page 54 in the Appendix for cabling rules.

Package Contents

Before installing the 10/100 Network In a Box, verify that you received all of the following items. If any item is missing or damaged, contact your vendor for replacement(s) as soon as possible.

- 2 EtherFast 10/100 LAN Cards
- Two Wake-on-Lan wires
- EtherFast 10/100 Auto-Sensing 5-Port Workgroup Hub
- Two 15' Category 5 Fast Ethernet RJ-45 Cables
- Two 3.5" Program Disks
- User Guide
- Internet LanBridge Software CD-ROM (optional)

About Plug-and-Play PCI Technology

The EtherFast 10/100 LAN Card is designed to run in a 32-bit desktop computer equipped with PCI expansion slots. The card is built to the PCI 2.1 standard.

Short for **Peripheral Components Interconnect**, PCI is a technology that allows special Plug-and-Play expansion cards to be automatically configured by a computer's **BIOS** (Basic Input/Output System) once they have been installed. Refer to your computer's user guide for more information about its BIOS.

When a PCI card is used in a computer that supports Plug-and-Play, the card is automatically configured each time the computer is booted. The card's IRQ, I/O address, and other operating parameters are automatically assigned.

There is no way to change a Plug-and-Play card's IRQ and other settings outside of the BIOS menu(s) that your computer provides. If the resources that are assigned to your EtherFast card seem to conflict with other devices in your computer, you will need to use your system's BIOS to resolve the conflicts.

If you have problems configuring your BIOS or resolving IRQ or other hardware conflicts, consult your computer manual or contact your PC's manufacturer for BIOS setup and configuration directions.

Here are some general guidelines to follow when installing a PCI card (like the EtherFast card) into your computer:

1. The EtherFast LAN adapter should be used in a 32-bit PCI slot that supports PCI Bus Mastering. It cannot be plugged into a PCI Bus Slave slot. Consult your motherboard's documentation for more information on master and slave slots.

2. If loading the EMM386.EXE program in your PC's CONFIG.SYS, you **MUST** use version MS-DOS 6.22 or above. If you load an older EMM386.EXE program (below DOS 6.22), your PC will hang up while loading the network driver.

3. When using NT, set your BIOS PCI settings to **MANUAL**. NT is not a Plug-and-Play OS, and will not usually recognize LAN cards if they are set to be automatically detected and configured. If you need to configure your PC's BIOS in order to resolve an IRQ or other conflict with the EtherFast card, there are a few possibilities:

No Changes Allowed

Your PCI may not allow you to change the IRQ value(s) of the PCI slot(s). In this case, you will **ONLY** be able to use the IRQ and I/O values that have been pre-assigned to each slot. The popular BIOS from Phoenix, for example, does not generally allow you to modify BIOS-assigned IRQ settings.

Jumper Changes

You may be able to change the IRQ & I/O values for a given PCI slot by setting jumpers on your PC motherboard. Please refer to your PC's motherboard user guide for specific instructions.

Menu Changes

Your PC may allow you to change the IRQ & I/O values for a given PCI slot by accessing the PC's BIOS setup menu. Please refer to your PC's user guide for specific details. The BIOSs from companies like AMI and Award are fully customizable from their BIOS menus, for example.

Hardware Setup

Before You Begin

The EtherFast 10/100 LAN Cards are equipped with an RJ-45 port that automatically adjusts to either 10Mbps or 100Mbps speeds at any duplex. Also known as N-way technology, the card's auto-sensing mechanism allows you to attach your computer to either Fast Ethernet (also known as 100BaseTX) or regular 10BaseT Ethernet network segments of any duplex without any special hardware or software settings required.

The card should only be used with RJ-45, twisted-pair cabling. 100BaseTX cabling is available in a number of different grades. Your kit comes with 8-wire, category 5 unshielded twisted-pair for use with both 10BaseT and 100BaseTX network segments. The cable that runs from your computer's EtherFast card to your hub should not exceed **100 meters** (328 feet) in length.

Extra Category 5 twisted-pair cabling can be purchased from most computer stores, or if you prefer, you can crimp your own cables. See page **53** for wiring information.

Whether you're building a 10Mbps or 100Mbps network, twisted-pair cabling should always be used with a hub. Each PC plugs into the hub with its own twisted pair cable. Because all of the PCs' cables converge at the hub's central location, a twisted-pair network is often referred to as a star configuration. Do not connect PCs together without a hub. Although your network may work, communication will be unstable.

Using the Wake-On-LAN Feature

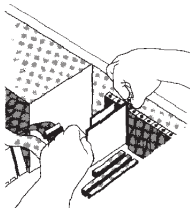
The EtherFast 10/100 LAN Card supports both *Magic Packet* and *Link Change* remote wake-up events.

Only install the Wake-On-LAN wires if your motherboard supports remote wake-up events. Improperly connecting the wire or connecting it to a socket on the motherboard other than the designated 3-pin socket can damage your hardware.

If you plan on using the Wake-On-LAN feature of the EtherFast 10/100 LAN Card, please skip to section about the card's Wake-On-Lan capabilities on **page 46**.

Installing the Hardware

1. Turn off your PC and any peripheral equipment attached to it. Remove the power cord or turn off the master switch on the back of the PC
2. Remove your computer's outside cover.
3. Open up your computer and locate the PCI expansion slot(s). Next, determine which of your PC's PCI slots is the master slot. (In newer PCs, the PCI slots are usually all master slots. Older PCs may have both master and slave slots. The EtherFast card must be inserted into a master slot). Your PC vendor can help you determine which slots are designed for 32-bit cards.
4. If you are using the Wake-On-LAN feature of the card, connect one end of the WOL wire to the 3-pin WOL socket on the network card. Connect the other end to the appropriate socket on the PC's motherboard.



5. Carefully slide the EtherFast card into your PC's slot. Make sure that all of its pins are touching the slot's contacts. After the card is firmly in place, secure its fastening tab to your PC's chassis with a mounting screw.

6. Replace your PC's cover, then turn on your computer. If your computer has a plug-and-play BIOS, it will automatically recognize the card and assign a unique IRQ ("interrupt") and I/O address to it. If your PC isn't plug-and-play compatible, consult your PC's user guide to see how you should go about assigning a unique IRQ and I/O address to a new interface card. Using your PC's BIOS menu, give the EtherFast card IRQ and I/O values that are not already in use by another interface card in your computer.

Installing the Cabling

1. Attach one end of a twisted-pair cable into the EtherFast card's RJ-45 port. Plug the other end of the cable into the EtherFast 10/100 Auto-Sensing 5-Port hub. You can plug the cable into any one of the five RJ-45 ports. If you are connecting either PC to port 1 on the hub, make sure that no cables are plugged into the uplink port.

2. Plug the 2-pronged end of the EtherFast Hub's supplied AC power supply into an AC electrical outlet. Plug the other end into the hub's DC power jack. The hub's green Power LED should light up. When the hub is in use, the other LED indicators will light up see page 66 of the Appendix for more LED information.

If the EtherFast 10/100 Auto-Sensing 5-port Hub encounters excessive network collisions or faulty cabling, it will automatically partition the node(s) responsible from the rest of the network, protecting the remaining nodes against potentially corrupted data. To reset the hub and clear any partitions, power the hub off, wait a few seconds, then turn it back on.

Expanding Your Network in the Future

If you want to add additional computers to your network in the future, all you need are more EtherFast 10/100 cards and 100BaseTX cables. Simply plug the new card(s) into your computer and run a cable from the card to one of the 5-Port hub's open ports.

For even greater expandability, the 5-Port Hub can be joined, or uplinked, to other hubs. If you look closely at the back of the hub, you will see that the port next to port 1 is marked **uplink**. Like most hubs, the 5-Port Hub's port number 1 and uplink port are joined internally. This means that if you plan on using the uplink port, you'll need to disconnect any cables that are connected to port 1.

To uplink the 5-Port hub, simply insert a standard, 100BaseTX cable between the 10/100 Auto-Sensing 5-Port Workgroup Hub's uplink port and any of another hub's 10Mbps or 100Mbps ports. Keep in mind that if ports 2-5 on the hub are running at 100Mbps, the uplink port can transmit data up to **100 meters** (328 feet) at 100Mbps. If any of the hub's ports are running at 10Mbps, the uplink port's distance capability drops to **5 meters** (16.4 feet) at 100Mbps.

For more detailed information on Ethernet and Fast Ethernet distance limitations, see page 54 in the Appendix of this guide.

Preparing to Install the Software

Setting up the EtherFast card's software involves installing a network driver onto your computer. The driver will allow the card to communicate with your Network Operating System software package, or NOS. Popular NOSs include Windows 98, Windows for Workgroups, Windows 95, Windows NT, Novell NetWare, and many others. The 3.5" software disk that is included with the EtherFast card contains network drivers for most NOS packages, along with instructions describing how to install them.

Before attempting to install a network driver for the EtherFast card, your NOS should already be installed on your computer.

If you are using Windows 98, Windows 95, Windows for Workgroups, Windows NT, or Novell NetWare, you will find the EtherFast card's network driver setup instructions printed in this user guide. Turn now to the appropriate section of this booklet to install the EtherFast card's network driver for your particular NOS.

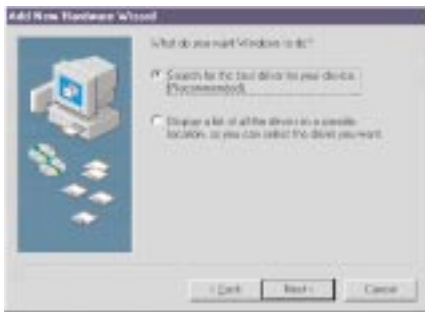
If you are using a NOS package other than the five listed above, you will find the network driver installation instructions on Program disk 1 that is included with the card. To read and/or print the network driver setup instructions for your particular network software package, insert the disk 1 into your computer's floppy disk drive and run the program on the disk called README.EXE. If you are using Windows 95, for example, you could click on **Start**, then **Run**, and type **a:\readme** to run the README program on the disk. After following the instructions on the EtherFast card disk, the EtherFast card will be ready for use.

Windows 98 Setup

After installing the EtherFast hardware in your computer, follow these instructions for installing the network driver. The installation procedure for the network driver will vary slightly depending on the version of Windows 98 you are using and your current system configuration. If at any time during the installation you encounter problems, consult the Troubleshooting section on page 55 of this guide.

To install the network driver:

1. Start up your computer and Windows 98.
2. Windows 98 will automatically detect the presence of the PCI Ethernet Card hardware in your computer.
3. While the Update Device Driver Wizard window is visible, put the EtherFast Card program disk 1 into drive A and click on **Next**.
4. The following window will appear, select "Search for the best driver for your device (Recommended)." Click on **Next**.



5. The following window will appear, make sure that "Floppy disk drives" is selected, and click **Next** to continue.



6. Windows will begin searching your drives for the correct device drivers. A message will appear that reads *Windows found the Linksys LNE100TX Fast Ethernet Adapter driver*. Click on **Finish**.

7. Windows 98 will begin copying a number of files onto your computer. If Windows asks you to supply your original Windows 98 installation or setup disks, insert the CD-ROM or disks as needed, and direct Windows 98 to the proper location. If Windows asks you to supply a driver that starts with the letters LNE, type **a:** in the box that pops up.

8. Windows will finish copying all of the necessary files to your system. When asked if you want to restart your computer, click **Yes**. Windows 98 driver setup is complete. Please continue on to the next sections, which will provide instructions for configuring Windows 98 so that your computer will operate correctly in a networked environment.

Preparing Windows 98 For Use on a Network -- Step 1

Once you are back at the Windows 98 desktop, you can make any necessary changes to your system's network settings by clicking on your taskbar's **Start** button, then **Settings**, then **Control Panel**, and then the **Network** icon.

The Network window will appear. Click on the **Configuration** tab.

Make sure that the following network components are installed:

Client for Microsoft Networks

Client for Netware Network

Linksys LNE100TX Fast Ethernet Adapter

IPX/SPX-compatible Protocol

NetBEUI



There may be other components listed in addition to the ones shown above. However, if any components shown above are missing, you'll need to install them manually. Skip to the section entitled Manually Installing Network Components at the back of this guide (page 64, step 3).

Preparing Windows 98 for Use on a Network – Step 2

Before enabling File and Printer Sharing, you should prepare your computer to be used with any file servers that may be on the network.

Using the Card with a NetWare File Server 3.11 or 3.12

Click on **My Computer**, **Control Panel**, and **Network**. Change the Network Logon to Client for NetWare Network. Next, double-click on the *Client for NetWare Networks*. Put your server's name in the Preferred Server box. Check the *Enable Logon Script Processing* box. Click on **OK** and restart your PC. For detailed instructions, please see page 52 of the Appendix.

Using the Card with a Windows NT File Server

Click on **My Computer**, **Control Panel**, and **Network**. Change the Primary Logon to Client for Microsoft Network. Double-click on the *Client for Microsoft Networks*. Check the *Log into Windows NT domain* box. Put your NT domain name in the Windows NT domain area. Click on **OK** and restart your PC. For detailed instructions, please see page 50 of the Appendix.

Continue with the installation instructions that appear on your screen, if any. When you're finished, restart your computer. The instructions on the next page explain how to enable file and printer sharing in Windows 98 so that your computer can be accessed by others and vice-versa.

Note: For setup of TCP/IP protocol, refer to your Microsoft Windows documentation or contact your system administrator.

Preparing to Use File and Printer Sharing

1. Start up Windows 98. If you are asked to log in, be sure to give your correct username and password.



2. To set up sharing for the first time on a computer, click on **Start, Settings, Control Panel**, then double-click on **Network**.

3. Click on the **Configuration** tab, followed by the **File and Printer Sharing** button. The File and Printer Sharing window will appear.

4. Decide what type of resources you'd like to make available on the network

- If you'd like others to be able to access the files on your PC's hard drive, select *I want to be able to give others access to my files.*
- If you'd like to share your printer with other users on the network, select *I want to be able to allow others to print to my printer.*

5. Click on the **OK** button. File and Printer Sharing for Microsoft Networks should now appear in the list of installed components. Click **OK**. When asked to restart your PC, choose to do so.

Enabling File Sharing

After following steps 1-5 on the previous page, double-click on your **My Computer** icon. A window of available disk drives will appear. Using your right mouse button, click once on the drive that you want to make available to other users. Click on **Sharing**, followed by the **Sharing** tab. Click on **Share As**.

In the Share Name box, give your computer a name (you can call it whatever you want--Mary's Computer, Tardis, etc.). Next, decide on the type of access that you want to give other users:

- **Read-Only access** lets other users view the files on your PC.
- **Full access** lets users create, change, or delete files on your PC.
- **Depends on Password** lets users have Read-Only and/or Full access, depending on the password that you decide to give them.

Use your mouse to select the type of file sharing access that you want other users to have. If you want to assign access password(s), type them into the Password box(es). When you're done, click on the **Apply** button, followed by **OK**. Your drive(s) can now be accessed from other users whenever they click on their Windows Network Neighborhood icons. If a user tries to access one of your drives that's password-protected, he or she will be asked for the appropriate Read-Only or Full access password.

How To Share Printers

After following steps 1-5 on page 15, double-click on your **My Computer** icon. Click on the **Printers** folder. A window of available printers will appear. Using your right mouse button, click once on the printer that you want to share with other users. Click on **Sharing**, followed by the **Sharing** tab. Click on **Share As**. In the Share Name box, give a name to the printer you're about to share (Jack's HP4, for example). If you want to assign a password to the printer so only certain users can access it, type a password in the Password box. When you're done, click on the **Apply** button, followed by **OK**. Your printer(s) are now shared.

When you're finished, restart your PC, log into your network, and double-click on **Network Neighborhood**. You should be able to see the other computers on your network. The installation is complete.

Note: Some printers may require extra steps or drivers to be shared on the network. Some printers are not networkable. Consult your printer's documentation or contact your printer's manufacturer for more information.

Windows 95 Setup

After installing the EtherFast hardware in your computer, follow these instructions for installing the network driver. The installation procedure for the network driver will vary slightly depending on the version of Windows 95 you are using and your current system configuration.

There are currently two versions of Windows 95:

- the original release (version A)
- a later release (also known as OSR2, or version B)

The installation procedure for the network driver will vary slightly depending on the version of Windows 95 that you are using.

To install the network driver:

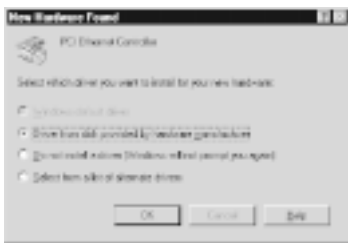
1. Start up your computer and Windows 95.
2. Windows 95 will automatically detect the presence of the EtherFast Card hardware in your computer. If a window that reads Update Device Driver Wizard appears as shown in the picture below, you are using Windows 95 version B.



If you are using version B, skip to page 19. Otherwise, follow the version A setup instructions on page 18.

Windows 95 Version A Setup

1. Windows 95 will detect the EtherFast card and display a New Hardware Found window as shown below.



2. Put the EtherFast Card software disk into drive A. Using your mouse, select the *Driver from disk provided by hardware manufacturer* option on the screen, then click **OK**. When asked for the location of the files, type **a:** and click **OK**.

3. Windows 95 will copy the appropriate network drivers to your computer. If 95 asks you to supply your original Windows 95 installation CD-ROM or setup disks, insert them into your computer and direct 95 to the proper directory on the disk(s).

After 95 is finished copying the necessary files to your computer, it may ask you to restart your computer. Choose to do so. After your system restarts, turn to page 21 and follow the instructions on preparing your PC for use on a network.

Windows 95 Version B Setup

1. While the Update Device Driver Wizard window is visible, put the EtherFast Card software disk into drive A and click on **Next**.
2. When the next window appears, click on the **Other Locations** button.

Type **a:** in the Location box and click on the **OK** button. Windows 95 will find the Linksys LNE100TX Fast Ethernet Adapter driver on the disk.

3. Click on the **Finish** button. Windows 95 will begin copying a number of files to your computer. If 95 asks you to supply your original Windows 95 installation CD-ROM or setup disks, insert them into your computer and direct Windows 95 to the proper directory on the disk(s). If 95 asks you to supply a driver that starts with the letters LNE, type **a:** in the box that pops up and press **Enter**.
4. When asked if you want to restart your computer, click on **Yes** and allow your system to restart.

Now go to page 21 to learn how to set up your PC for use on a network.

Preparing Windows 95 For Use on a Network -- Step 1

Once you are back at the Windows 95 desktop, you can make any necessary changes to your system's network settings by clicking on your taskbar's **Start** button, then **Settings**, then **Control Panel**, and then the **Network** icon.

The Network window will appear. Click on the **Configuration** tab.

Make sure that the following network components are installed:



Client for Microsoft Networks

Client for Netware Network

Linksys LNE100TX Fast Ethernet Adapter

IPX/SPX-compatible Protocol

NetBEUI

There may be other components listed in addition to the ones shown above. However, if any components shown above are missing, you'll need to install them manually. Skip to the section entitled Manually Installing Network Components at the back of this guide on page 64.

Preparing Windows 95 for Use on a Network -- Step 2

Before enabling File and Printer Sharing, you should prepare your computer to be used with any file servers that may be on the network.

Using the Card with a NetWare File Server 3.11 or 3.12

Click on **My Computer**, **Control Panel**, and **Network**. Change the Network Logon to Client for NetWare Network. Next, double-click on the *Client for NetWare Networks*. Put your server's name in the Preferred Server box. Check the *Enable Logon Script Processing* box. Click on **OK** and restart your PC. For more detailed instructions, see page 52.

Using the Card with a Windows NT File Server

Click on **My Computer**, **Control Panel**, and **Network**. Change the Primary Logon to Client for Microsoft Network. Double-click on the *Client for Microsoft Networks*. Check the *Log into Windows NT domain* box. Put your NT domain name in the Windows NT domain area. Click on **OK** and restart your PC. For more detailed instructions, please refer to page 50 in the Appendix of this guide.

Continue with the installation instructions that appear on your screen, if any. When you're finished, restart your computer. The instructions on the next page explain how to enable file and printer sharing in Windows 95 so that your computer can be accessed by others and vice-versa.

Preparing to Use File and Printer Sharing

1. Start up Windows 95. If you are asked to log in, be sure to give your correct username and password.
2. To set up sharing for the first time on a computer, click on **Start, Settings, Control Panel**, then double-click on **Network**.
3. Click on the **Configuration** tab, followed by the **File and Printer Sharing** button. The File and Printer Sharing window will appear.
4. Decide what type of resources you'd like to make available on the network
 - If you'd like others to be able to access the files on your PC's hard drive, select *I want to be able to give others access to my files*.
 - If you'd like to share your printer with other users on the network, select *I want to be able to allow others to print to my printer*.
5. Click on the **OK** button. File and Printer Sharing for Microsoft Networks should now appear in the list of installed components. Click **OK**. When asked to restart your PC, choose to do so.

Enabling File Sharing

After following steps 1-5 on the previous page, double-click on your **My Computer** icon. A window of available disk drives will appear. Using your right mouse button, click once on the drive that you want to make available to other users. Click on **Sharing**, followed by the **Sharing** tab. Click on **Share As**.

In the Share Name box, give your computer a name (you can call it whatever you want--Mary's Computer, Tardis, etc.). Next, decide on the type of access that you want to give other users:

- **Read-Only access** lets other users view the files on your PC.
- **Full access** lets users create, change, or delete files on your PC.
- **Depends on Password** lets users have Read-Only and/or Full access, depending on the password that you decide to give them.

Use your mouse to select the type of file sharing access that you want other users to have. If you want to assign access password(s), type them into the Password box(es). When you're done, click on the **Apply** button, followed by **OK**. Your drive(s) can now be accessed from other users whenever they click on their Windows Network Neighborhood icons. If a user tries to access one of your drives that's password-protected, he or she will be asked for the appropriate Read-Only or Full access password.

How To Share Printers

After following steps 1-5 on page 23, double-click on your **My Computer** icon. Click on the **Printers** folder. A window of available printers will appear. Using your right mouse button, click once on the printer that you want to share with other users. Click on **Sharing**, followed by the **Sharing** tab. Click on **Share As**. In the Share Name box, give a name to the printer you're about to share (Jack's HP4, for example). If you want to assign a password to the printer so only certain users can access it, type a password in the Password box. When you're done, click on the **Apply** button, followed by **OK**. Your printer(s) are now shared.

When you're finished, restart your PC, log into your network, and double-click on **Network Neighborhood**. You should be able to see the other computers on your network. The installation is complete.

Note: Some printers may require extra steps or drivers to be shared on the network. Some printers are not networkable. Consult your printer's documentation or contact your printer's manufacturer for more information.

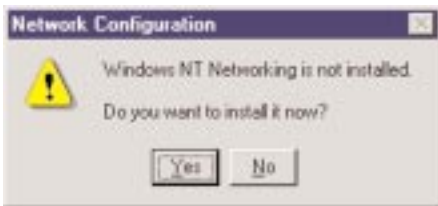
Windows NT 4.0 Setup

The instructions that follow explain how to set up an NT 4.0 server/workstation.

You should have your original Windows NT CD-ROM handy during the installation, as you might be asked to supply it. Always contact your network administrator or consult your NT documentation if you have questions.

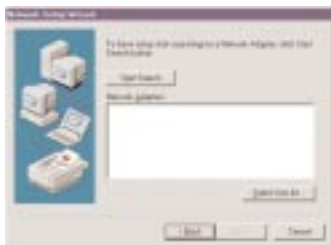
To install the network driver for an NT 4.0 Server or Workstation:

1. Start up your computer and Windows NT 4.0. Enter your username and password if asked to do so.
2. Click on **Start, Settings, Control Panel**, and then double-click on the **Network** icon.
3. If you have not installed Windows NT networking on your computer before, a message appears that reads: *Windows NT Networking is not installed. Do you want to install it now?*

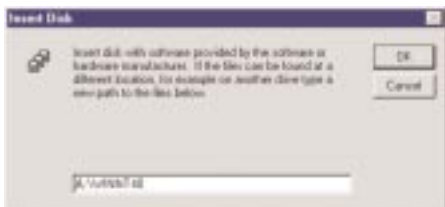


- If you see this message, click on **Yes** to install NT networking along with the EtherFast Card's network driver, and continue with step 1 on the next page.
- If you don't see this message, NT networking is already installed. Continue with step 1 on page 30. Installing NT Networking and the EtherFast Network Driver

1. After clicking on **Yes**, the Network Setup Wizard window will appear.
2. Put a checkmark next to the *Wired to the network option*, then click on **Next**.
3. When the next screen appears, click on the **Select from list...** button to select a network adapter.



4. When the list of available network adapters appears, click on the **Have Disk** button. Insert the EtherFast Card disk into drive A. Type **a:\winnt** into the box on your screen and press the **Enter** key on your keyboard.



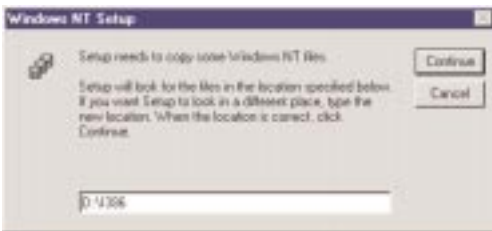
5. When the Linksys LNE100TX Fast Ethernet Adapter entry appears, click **OK**. The adapter will be added to the list of installed Network Adapters with a checkmark next to it.



6. Click **Next**, then put checkmarks next to all of the network protocols that you want to install. See your Microsoft Windows NT user guide(s) or talk to your network administrator for more information about network protocols. When you're finished, click on **Next**.

7. Choose the services that you want to install. Your Microsoft NT user guide(s) contain information about how services work. When you're finished, click on **Next**, followed by **Next** again.

8. NT will probably ask you to supply your original Windows NT CD-ROM or setup disks. Supply them as needed.



9. NT will ask you to choose a media type, or type of cabling, for the EtherFast card. Choose the **AutoDetect** option and click on **Continue**.

10. NT will copy the necessary network drivers to your computer. When the copying is complete, you will see a list of installed bindings. You can change the bindings settings as necessary if needed. When all of the settings are acceptable, click on **Next**, then **Next** again to start the NT network.

11. When asked to do so, enter your computer's **Computer Name**.

Then choose either Workgroup or Domain, depending on the type of network you're setting up. Your NT user guide(s) explain the difference between Workgroups and Domains.



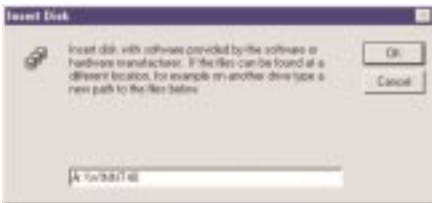
When you're finished, click on **Next**, followed by **Finish**. When asked if you want to restart your computer, click on **Yes**.

After your computer restarts, the network setup is complete. To see the rest of the network, double-click on the **Network Neighborhood** icon that resides on your NT desktop. The setup is complete.

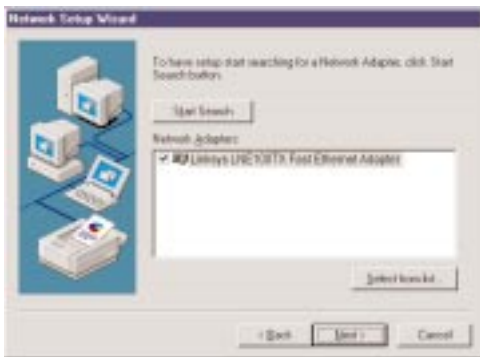
Installing the EtherFast Network Driver in NT 4.0

Since NT networking is already installed, you'll only need to install the EtherFast Card network adapter and configure your network settings to get NT networking up and running. To do this:

1. Click on **Start, Settings, Control Panel**, then double-click on the **Network** icon.
2. When the networking window appears, click on the **Adapters** tab. Click on the **Add** button.
3. When the list of available network adapters appears, click on the **Have Disk** button.
4. Put the EtherFast Card disk into drive A. Type **a:\winnt** into the box on your screen and click **OK**. NT will copy the necessary network drivers to your computer.



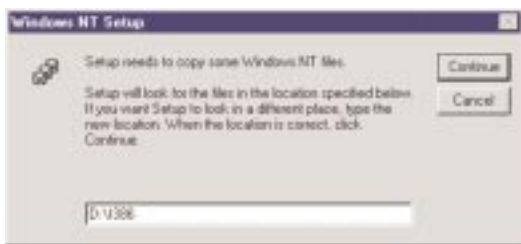
5. When Linksys LNE100TX Fast Ethernet Adapter appears in the adapter box, click **OK**.



6. When NT asks you for the media type or type of cabling, choose **AutoDetect** and click **OK**.

7. Choose the services that you want to install. Your Microsoft NT user guide(s) contain information about how services work. When you're finished, click on **Next**, followed by **Next** again.

8. NT will probably ask you to supply your original Windows NT CD-ROM or setup disks. Supply them as needed.



9. NT will ask you to choose a media type, or type of cabling, for the EtherFast card. Choose the **AutoDetect** option and click on **Continue**.

10. NT will copy the necessary network drivers to your computer. When the copying is complete, you will see a list of installed bindings. You can change the bindings settings as necessary if needed. When all of the settings are acceptable, click on **Next**, then **Next** again to start the NT network.

11. When asked to do so, enter your computer's **Computer Name**.

Then choose either Workgroup or Domain, depending on the type of network you're setting up. Your NT user guide(s) explain the difference between Workgroups and Domains.



When you're finished, click on **Next**, followed by **Finish**. When asked if you want to restart your computer, click on **Yes**.

After your computer restarts, the network setup is complete. To see the rest of the network, double-click on the **Network Neighborhood** icon that resides on your NT desktop. The setup is complete.

Windows for Workgroups Setup

After installing the EtherFast card hardware in your computer, follow the instructions below to install the EtherFast Card's Windows for Workgroups network driver from the card's software disk.

Before attempting the installation, you should have your original Windows for Workgroups disks handy.

1. Locate the Program Manager. Click on **Window**. Select **Network** and open the Network group. Double-click on the **Network Setup** icon.
2. Click on the **Networks** button. Choose *Install Microsoft Windows Network*, then click **OK**.
3. In the Network Setup window, click on the **Drivers** button, followed by **Add Adapter**.
4. Choose the first option in the list: *Unlisted or Updated Network Adapter*. Click **OK**.

When asked to supply a driver disk, insert the first EtherFast disk into drive A and type **a:\wfw311** into the box on your screen. Click **OK**.

Linksys LNE100TX Fast Ethernet Adapter will appear in the Network Adapter box. Click **OK**, followed by **Close**.

5. When the Network Setup window reappears, click on the **Sharing** button.

After the Sharing window appears, use your mouse to put a checkmark next to any of the following options that you want:

...give others access to my files.

...allow others to print to my printer(s).

6. When you're finished, click the **OK** button. When the Network Setup window reappears, click **OK**.

7. Enter your **User Name**, **Workgroup**, and **Computer Name** in the boxes provided. When you're done, click **OK**. Your Windows for Workgroups user guide(s) explain these entries in more detail.

8. If Windows for Workgroups asks you to provide any of your original Windows setup disks, supply them as needed. When asked to restart your computer, click on **Restart Computer**.

The networking software setup for Windows is complete. To see the rest of your network after your computer restarts, open up the Windows File Manager.

For additional help on sharing files and printers in Windows for Workgroups, see your user guides or click on the File Manager Help option.

Novell NetWare Setup

The instructions below cover the following versions of Novell NetWare:

- NetWare workstations for DOS & Windows 3.x
- Client32 for Windows 95 & Windows 98
- 3.12, 4.x, and 5.0 NetWare Servers

If you have a version or type of NetWare not shown above, run the README program on the EtherFast Card disk to obtain the installation instructions for your version. See page 10 for more information about the README.

Installing NetWare Workstations for DOS (6.22 or higher) and Windows 3.x Users

The installation of the EtherFast Card's Novell workstation drivers is accomplished with a program on the EtherFast Card disk called DIAG. DIAG will copy the appropriate network drivers to your computer, generate a NetWare NET.CFG file, and automatically update your AUTOEXEC.BAT and CONFIG.SYS system files.

DIAG also comes with a built-in diagnostic feature that allows you to test the EtherFast Card's functionality at any time. For more instructions on testing the card, see the Troubleshooting section at the end of this guide.

1. Start up your computer in DOS. Insert the EtherFast Card disk into drive A.
2. From the DOS command prompt (C:\>), type the following commands one-by-one. Press the **Enter** key after each command:

```
a:install
```

3. When you type install, a new directory called DIAG will be created on your C: drive, and the DIAG setup and diagnostic program will be copied to it.
4. When you're ready to run DIAG, just type the following commands from the DOS command prompt (C:>) and press **Enter** after each one:

```
c:  
cd c:\diag  
diag
```

After typing the diag command, the EtherFast Diagnostics program will appear. The program will allow you to install your Novell network workstation drivers.

5. When the program window appears, press **Alt-A** (the **Alt** and **A** keys together) to select the **AutoInstall** option from the menu. (You can also use your mouse to click on the **AutoInstall** button if you prefer).
6. Next, using the arrow keys on your keyboard, highlight the DOS ODI Workstation option and press **Enter**.
7. Enter the directory in the Destination Directory box where you want your Novell network drivers to be installed, or you can use the default directory of **c:\nwclient**.
8. Next, press **Alt-S** to choose the Server Type that you are using. When the list of servers appears, use the arrow keys on your keyboard to scroll through the list. Highlight the type of server that your workstation will be using and press **Enter** to select it.
9. When you're ready to install the software for your workstation, press **Alt-I** to begin the setup. DIAG will begin distributing the appropriate network driver files to your computer.

During the installation, your AUTOEXEC.BAT and CONFIG.SYS files will be automatically modified. The old versions of these files will be saved as AUTOEXEC.LNK and CONFIG.LNK for later retrieval if you need to revert to them in the future.

When the installation is complete, press **OK**, then select **Exit** from the menu to return to DOS.

The EtherFast Card's NetWare driver is completely installed. Restart your computer and log into the network.

Novell Client32 Setup for Windows 95 and 98

Client32 drivers are required for connecting to a 4.x or 5.0 server while in Windows 95 only.

*If you are using Windows 98, you must obtain the latest version of Client32. The installation is very similar to that of Windows 95 OSR2. Follow the OSR2 (version B) instructions below. When asked for the location of the drivers, specify **a:\client32** on the EtherFast 10/100 LAN Card program diskette.*

Before you begin, obtain the Client32 disks or CD-ROM from Novell. You may be able to download a copy of the disk(s) from Novell's BBS or web site.

Follow the directions below to install and/or configure your Client32 drivers for use with the card.

1. If Novell's Client32 drivers are already installed on your computer, do the following to remove any network adapter settings that may conflict with the EtherFast card: Click on **Start, Settings, Control Panel**, and double-click on the **Network** icon. If you see any network adapters listed in the box, remove them. Finally, remove all floppy disks from your computer and reboot.
2. If you have not installed Novell's Client32 drivers onto your computer, run the Client32 SETUP.EXE program. When the program appears, click **Yes**, followed by **Start** to begin the installation. When Setup is finished copying files to your system, reboot.
3. After Windows is up and running, remove all floppy disks from your computer. Insert the EtherFast card into your PC.

There are currently two versions of Windows 95:

- the original release (version A)
- a later release (also known as OSR2, or version B)

The Client32 installation procedure will vary from this point forward depending on the version of Windows that you're using.

If you are using Windows 98, click **Next**. Chose *Search for the best driver for your device (recommended)* and click **Next**. Skip to step 8.

If a window appears that is titled *New Hardware Found*, you are using version A. Skip to step 4 below.

If a window appears that is titled *Device Driver Wizard* instead, you are using version B. Skip to step 7 below.

4. You are using version A. Click **OK**. Click on the *Driver from disk provided by hardware manufacturer* option, then click **OK**.

5. Put the EtherFast card disk into drive A. Type **a:\client32** and press Enter.

If you receive a Msgsrv32 error message, don't worry -- just click on the **Ignore** button. Some versions of the Client32 Novell software have a bug. Ignore it and proceed.

6. Windows 95 will begin copying files. Supply any setup disks or CD-ROMs as necessary. When asked if you want to restart your computer, choose **Yes**. Skip to step 10.

7. You are using version B. Click **Next**. Windows 95 will scan your computer.

8. Click on the **Other Locations** or **Specify Location** button when it appears. Put the EtherFast card disk into drive A. Type **a:\client32** and press **Enter**. Windows 95 will locate the client driver. Click on the **Finish** button.

If you receive a Msgsrv32 error message, don't worry -- just click on the **Ignore** button. Some versions of the Client32 Novell software have a bug. Ignore it and proceed.

9. When the installation is complete, restart your computer.

10. After rebooting your PC, click on **Start, Settings, Control Panel**, and double-click on the **Network** icon. Double-click on **Novell NetWare Client32** and make any setting changes as necessary. When you're finished, save them and reboot.

The Client32 drivers have been installed. You should now be able to access your Novell NetWare network through the Network Neighborhood icon.

If you would also like to enable Windows 95 or 98 built-in networking in order to share files, drives, and printers between computers, follow all of the directions in the *File and Printer Sharing for Windows 95 or 98* section of this user guide.

Installing a 3.12 Server

The EtherFast Card network driver is installed during the NetWare installation process. During the setup you may want to refer to your NetWare 386 v3.12 Installation Manual for help. You will also be using ConfigDisk during the setup.

1. Make a directory in the DOS partition of your file server called LNE100.

2. Copy the following files from the card's disk 2 to your file server's new LNE100 directory:

```
a:\netware\server\3.12\NBI31X.NLM
a:\netware\server\3.12\MSM31X.NLM
a:\netware\server\3.12\ETHERTSM.NLM
a:\netware\server\3.12\LNE100TX.LAN
```

3. Following the Load LAN Driver Module instructions in your Novell NetWare 386 v3.12 manual, start NetWare and configure the server if you haven't already.

4. Load the LAN drivers above using the **LOAD** command.

If the LAN driver is not located in the default directory, specify the file's path on the command line. The **LOAD** command prompts you for the configuration parameters if they are not supplied on the command line.

You can save the **LOAD** command line parameters in a file with the name **AUTOEXEC.NCF** so they execute automatically when the server starts. See the Novell NetWare 386 v3.12 Installation Manual for details on how to create the **AUTOEXEC.NCF** file.

5. At the server command line, type:

```
LOAD c:\LNE100\NBI31X.NLM
LOAD c:\LNE100\MSM31X.NLM
LOAD c:\LNE100\ETHERTSM.NLM
LOAD c:\LNE100\LNE100TX.LAN
```

6. Bind a protocol to the driver. For example:

```
BIND IPX TO LNE100TX NET=XX
```

where **XX** is the logical network address for the frame type in your **LOAD** command.

The load and binding are complete. The server is ready to be used.

Installing a 4.x Server

The EtherFast Card network driver is installed during the NetWare installation process. During the setup you may want to refer to your NetWare 386 v4.0 installation Manual for help. You will also be using ConfigDisk during the setup.

At the NetWare prompt (indicated by the server name), run the INSTALL.NLM program by typing `load install`.

1. Select *Maintenance/Selective Install* and press **Enter**.
2. Select *LAN Driver Options* and press **Enter**.
3. Press the **Insert** or **Ins** key on your keyboard to insert a new driver. Put the EtherFast card's program disk 2 into drive A or B.
4. Press **F3** and specify the driver path. If the EtherFast Card disk is in drive A:, for example, type `a:\netware\server\4.x` and press **Enter**. The program will locate the EtherFast Card's LNE100TX.LAN and LNE100TX.LDI files on the disk.
5. The LNE100TX.LAN driver will appear as an option in the *Select a LAN Driver* field. Choose this driver to start the loading and binding procedure.
6. Add the **LOAD** and **BIND** statements to your server's AUTOEXEC.NCF file so that the LAN driver loads automatically each time your server is started up.

The load and binding are complete. The server is ready to be used.

Installing a 5.0 Server

Follow these directions to set up a Novell NetWare 5.0 server.

1. Insert the EtherFast 10/100 LAN Card program disk into drive A.

2. At the NetWare prompt, run the INSTALL.NLM program by typing:

<server name>: **LOAD INSTALL**
and press **Enter**.

3. Select the Maintenance/Selective Install option and press **Enter**.

4. Select LAN Driver Options and press **Enter**.

5. Press the **Ins** key to specify other drivers that you wish to install.

6. Press **F3** and specify the driver path:

A:\NETWARE\SERVER\5.0 then press **Enter**.

7. The LNE100TX.LAN driver should appear in the *Select a LAN Driver* field. Choose this driver to start the driver loading and binding procedure. This will allow you to load and bind all 4 frame types supported by NetWare.

8. Add the **LOAD** and **BIND** statements required to the server's AUTOEXEC.NCF file. This instructs the server to load the LAN driver automatically each time the server starts up.

The setup is complete.

If you notice excessive “Tx FIFO Underflow” or “Rx FIFO Overflow” counts on your server in the LAN/WAN menu of your driver custom counters **and** you have a PCI computer with a Saturn or Mercury chipset, try using the keyword TURBO when loading the driver.

For example, type:

```
LOAD LNE100TX FRAME=ETHERNET_II TP  
TURBO
```

and press **Enter**.

Wake-On-LAN

The EtherFast 10/100 LAN Card supports both *Magic Packet* and *Link Change* remote wake-up events.

Magic Packet is a type of Wake-On-LAN event developed by AMD. Basically, an administrator can send a “wake-up” packet to a specific MAC address on the network. That computer then boots up and the administrator can perform tasks or access the PC’s drives. After the work is done, the PC either goes into a sleep mode (using about 10% of the normal amount of power) or it shuts off completely, depending on the management software being used.

Link Change is a remote wake up event that is triggered by any change in the EtherFast card’s link state. If you have Wake-On-LAN networking set up on the PC, plugging an active network cable into the LAN Card will cause the PC to turn itself on automatically.

Only install the Wake-On-LAN wires if your motherboard supports remote wake-up events. Improperly connecting the wire or connecting it to a socket on the motherboard other than the designated 3-pin socket can damage your hardware.

What is Wake-On-Lan?

Different kinds of motherboards support different management events. Keep in mind that there is no *de facto* standard for Wake-On-LAN support. Every motherboard has different support for different events. Most common are the **Power Management Event** (PME) and **Remote Wake-Up** (RWU-high power and RWU-low power).

There are also two different types of Remote Wake-Up compatible motherboards -- high power and low power. Remote Wake-Up is a little different than PME, but both events achieve the same goal. Of course, every LAN is built differently, and every administrator uses different software to manage the network. The EtherFast 10/100 LAN card comes with a few basic programs that are capable of sending wake-up packets to your networked PCs. For more advanced features, it is best to use a third-party network management software package.

With the right software, administrators can run a variety of tasks on multiple PCs after-hours or on weekends, thus saving administration time, user downtime, and the overall hassle of performing multiple tasks by hand.

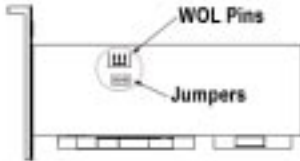
Motherboard Support

As mentioned earlier, WOL-compatible motherboards can offer support for a number of different Wake-On-LAN interfaces. The EtherFast 10/100 LAN Card is compatible with PME, RWU-high, and RWU-low. Consult your motherboard documentation that came with your PC to find out which type your computer will use to communicate with the network card. In some cases, you may need to enable the WOL support in your PC's BIOS.

Before you continue, find the **jumpers** on your EtherFast 10/100 LAN Card. Use these jumpers to match the EtherFast card's function with the type of Wake-On-LAN support provided with your PC's motherboard. Use the diagrams on the next page for help.

Setting Up Your EtherFast LAN Card for Wake-On-LAN Use

1. Use the diagram below to locate the WOL pins and the jumpers on the EtherFast LAN Card.



2. Connect one end of the 3-pin Wake-On-LAN wire to the EtherFast LAN Card.

3. Now you need to set the jumpers on your card according to whether your motherboard supports RWU-high, RWU-low, or PME. Keep in mind that the jumpers are numbered backwards: the numbers read right to left and down to up.

If your motherboard supports **Remote Wake-Up High** (RWU-high), set your jumpers like this:



If your motherboard supports **Remote Wake-Up Low** (RMU-low), set your jumpers like this:



If your motherboard supports **Power Management Event** (PME), set your jumpers like this:



Once your jumpers are set, be sure to write down the MAC address of the network card. It is either silkscreened on the card itself or it is noted on a sticker attached to the card. If no MAC address is given with the card, you can either run the card's diagnostics (page 59), or run one of the programs described in the next section. Install the card and continue with the driver setup as usual.

Sending a Magic Packet

In order to use the WOL feature of the EtherFast LAN Card, you need to know the MAC address of the card. If you don't know the MAC address, go to **Start, Run**, and then type **wini~~pc~~g~~f~~**. If you are using NT, go to a command prompt, then type **ipconig /all**. In both cases, the MAC address will be displayed.

1. Turn off the PC on which you want to test the WOL feature. Go to another PC on the network and log in.
2. Go to an MS-DOS prompt (click on **Start, Run**, then type **command** and hit **Enter**) and insert the driver diskette. Type a **: \ACPI\WOL_SET**. The program will then ask for the destination of the magic packet. Enter the EtherFast LAN Card's MAC address.
3. Check to make sure that the PC has woken up.

Testing Link Change

This test will see if your PC responds to a change in the network link state by waking up. Use a configured PC that is on an active network link.

1. Turn your PC off and disconnect it from the network either by turning off the hub or switch or by disconnecting the network cable from the LAN card.
2. Wait about ten seconds, then plug the cable back in or turn the hub on. The PC should wake up.

Appendix

Windows 98 or 95/NT 4.0 Client Setup

If you are installing the EtherFast LAN Card in a Windows 95 or 98 PC that you plan on logging into a NT 4.0 file server, follow the directions below.

1. Follow the Windows 95 setup instructions or the Windows 98 setup instructions
2. Start up Windows. Click on **Start, Settings**, then **Control Panel**. Double-click on **Network**. The Network window appears. Click on the **Configuration** tab.
3. In the Primary Logon Box, you have two choices. Choose one:

Client for Microsoft Networks

Tells your PC to log into an NT 4.0 server where you already have a username and password set up.

Windows Logon

Log in without a password, or log into both NT and Novell NetWare servers in order on the network.

4. Under the The following network components are installed box, highlight Client for Microsoft Networks and click on the **Properties** button.
5. The *Client for Networks Properties* window will appear. Under the *Logon Validation* box, make sure that *Log on to Windows NT domain* is checked. Enter the name of your domain into the *Windows NT Domain* box
6. Click on the **Access Control** tab. Make sure that *Share-level access control* is selected; do not choose *User-level access control*.

If Access Control is grayed out and cannot be selected, refer to Problem 5 in the Troubleshooting section.

7. When you're done, click **OK**. When asked if you want to restart your PC, choose to do so. The NT portion of the Windows setup is complete.

Novell 3.x Client Setup for Windows 98 or 95

The instructions below explain how to set up the regular Novell NetWare 3.x client for use on a Windows 98 or 95 PC. If you are installing NetWare's Client32 software instead, follow the instructions on page 38.

1. Follow the Windows 95 setup instructions or the Windows 98 setup instructions.
2. Start up Windows 95 or 98. Click on **Start**, **Settings**, then **Control Panel**. Double-click on **Network**. The Network window appears. Click on the **Configuration** tab.
3. In the Primary Logon Box, choose *Client for NetWare Networks*.
4. Under the The following network components are installed box, highlight *Client for NetWare Networks* and click on the **Properties** button.
5. The *Client for NetWare Networks Properties* window appears. Under the **General** tab, enter the name of your network's Preferred Server. *Assign the First Network Drive Letter*; the default is F. Make sure the **Enable** logon script processing is checked.
6. Click **OK**. Click on the **Access Control** tab. Make sure the *Share-level access control* option is selected; do not select *User-level access control*.
7. When you're done, click **OK** to restart your computer. The NetWare portion of your Windows setup is complete.

Twisted-Pair Cabling

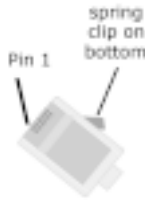
There are different grades, or categories, of twisted-pair cabling. Category 5 is the most reliable and widely compatible, and is highly recommended. Category 3 is a good second choice. Straight-through cables are used for connecting computers to a hub. Crossed cables are used for connecting a hub to another hub (there is an exception: some hubs have a built-in uplink port that is crossed internally, which allows you to uplink hubs together with a straight cable instead).

You can buy Category 5 cabling that is pre-made, or cut and crimp your own. Category 5 cables can be purchased or crimped as either straight-through or crossed. A Category 5 cable has 8 thin, color-coded wires inside that run from one end of the cable to the other. All 8 wires are used. In a straight-through cable, wires 1, 2, 3, and 6 at one end of the cable are also wires 1, 2, 3, and 6 at the other end. In a crossed cable, the order of the wires change from one end to the other: wire 1 becomes 3, and 2 becomes 6.

straight-through cable		crossed cable	
Wire	Becomes	Wire	Becomes
1	1	1	3
2	2	2	6
3	3	3	1
6	6	6	2

The color code for the 4 wires should be as follows: **Wire 1**, white with an orange stripe; **Wire 2**, orange; **Wire 3**, white with a green stripe; **Wire 6**, green. The other four wires have to be connected as follows: **Wire 4**, blue; **Wire 5**, white with a blue stripe; **Wire 7**, white with a brown stripe, **Wire 8**, brown.

To figure out which wire is wire number 1, hold the cable so that the end of the plastic RJ-45 tip (the part that goes into a wall jack first) is facing away from you. Flip the clip so that the copper side faces up (the springy clip will now be parallel to the floor). When looking down on the coppers, wire 1 will be on the far left.



Cabling Rules

Hub-to-Hub (100BaseTX)	10 meters (32.8 feet)
Hub-to-Hub (10BaseT)	100 meters (328 feet)
Hub-to-Switch	100 meters (328 feet)
Workstation to Hub	100 meters (328 feet)
PrintServer to Hub	100 meters (328 feet)

- Computers should never be connected directly together on a network. They should **always** be connected to a hub.
- Only **two** 100Mbps Fast Ethernet hubs can be cascaded, (or *uplinked*), together. To cascade more than 2 100Mbps hubs, a switch or a repeater must be used.
- The maximum cable length from a node to a repeater, switch, or hub is **100 meters** (328 feet).
- The maximum length for a Category 5 cable between a 100BaseTX or 10BaseT workstation and a stackable or other shared bandwidth hub is **100 meters** (328 feet).
- The maximum distance between 2 100BaseTX hubs without a switch is **5 meters** (16.4 feet).
- The maximum distance between 2 10BaseT hubs, (or a 10BaseT hub and an Auto-Sensing hub), is **100 meters** (328 feet).

Troubleshooting

Troubleshooting hints for Windows can be found below. If you are using Windows NT, NetWare, or another network operating system, skip to the Card Diagnostics instructions on page 58.

Troubleshooting Hints for Windows 95 and 98

Problem 1: Windows doesn't detect new hardware with the EtherFast Card hardware installed, or it continues to detect the card each time you restart your PC.

Solutions

You might not have inserted the PCI card correctly or securely into the appropriate slot of your computer. Check that the card is securely inserted into the appropriate slot.

You may have previously aborted a new hardware setup. Follow the directions on page 60.

The motherboard in your system might not be Plug-and-Play compatible, your PC's Plug-and-Play settings may not be enabled, or the motherboard may have Plug-and-Play options not supported by Windows 95/98. If you are not sure, contact your PC's manufacturer.

Problem 2: Windows can't locate the driver for the EtherFast Card device.

Solutions

You may have inserted the wrong diskette into your PC's drive.

The diskette may be defective or files may be missing. Make sure the disk has files called LNE100TX, LNE100.DOS, and LNE100.SYS in a:\ or a folder called Win95 for Window 95 and Win98 for Windows 98

Problem 3: The Windows Logon screen doesn't appear after you restart your computer.

Solutions

Click on **Start, Shut Down, then Close All Programs and Logon as a Different User**. If this doesn't solve the problem, your PC's manufacturer may have disabled Windows' networking. Contact your computer's manufacturer for help.

Problem 4: After entering a username and password, a window appears that reads, "No Domain Server could be found to validate your Username and Password."

Solution

Click on **Start, Settings, Control Panel**. Double-click on **Network**. Click on the **Configuration** tab. Under The Following Network Components are Installed box, highlight *Client for Microsoft Networks* and click on the **Properties** button. Once you are in the *Client For Microsoft Networks* Properties window, make sure that *Log on to Windows NT Domain* is unchecked. Once you have made sure that it is unchecked click on the **OK** button.

Problem 5: On the Access Control Tab, *User Level Access* is selected, but *Shared Level Access* is grayed out and not accessible.

Solutions

You previously had your primary network logon set to Client for Netware Networks. On the Configuration Tab of the Network Properties window, make sure that your primary network logon is set to Client for Microsoft Networks.

Problem 6: In Network Neighborhood you can only see your self and no other computers on the network.

Solutions

Make sure that the cables are connected correctly. Make sure you are getting Link or Activity lights on both the EtherFast Card and your hub. Try changing to a new cable that you know is working.

Your workgroup name may be different from other computers on your network. Make sure each PC on the network is using the same workgroup name.

Problem 7: In Network Neighborhood, you can see all other computers on the network but not yourself, and all other computers can see each other and not your computer.

Solutions

You may have not have enabled File and Printer Sharing. To do so, go to Windows 95 or 98 installation.

The network card might not be setup properly. Try reinstalling the card. Skip to page 60.

Problem 8: Network Neighborhood is Empty.

Solutions

Verify that your Microsoft Client is installed. See the Windows 95 or 98 setup instructions in this guide for directions.

Problem 9: You receive DHCP Errors in Windows.

Solutions

Remove the TCP/IP component from Windows' networking. To do this, click on **Start, Settings, Control Panel**, then double-click on **Network**. Click once on the component entry with the word TCP/IP in it, then click on the **Remove** button. Click **OK** when finished. If the problem persists, try running the diagnostics on the following page.

Running the Card's Diagnostics

If you suspect that there may be a problem with the EtherFast Card, you can use the DIAG diagnostic program on the EtherFast Card disk to test the card's internal and external network functions.

To run the program, start up your computer in DOS. The program only works in standard DOS – it won't work in a Windows DOS window. If you are using Windows, you can get to DOS by restarting your computer, then by pressing the **F8** key when the *Starting Windows...* message appears. From the menu that is shown next, choose *Safe Mode Command Prompt Only*. If you're using NT, boot up your PC with a DOS boot disk or Windows Recovery Disk.

1. Insert the EtherFast Card into drive A. Then from the DOS command prompt (C:\>), type the following commands in order. Press **Enter** after each one:

```
a:  
cd a:\diag  
diag
```

2. When the EtherFast Diagnostics Program appears, press **Alt-T** to start the testing procedure.

3. When the Testing window appears, use your arrow keys and spacebar on the keyboard to put an **X** next to the tests you'd like to run. The tests include Register, LoopBack, Peer-to-Peer, Ping, and Bandwidth.

Note: Peer-to-Peer is designed to test the signal between two PCs. Both PCs must be running the test at the same

time. Unless you have two PCs with the same card, don't enable this test.

4. When you've selected the desired tests, press **Alt-T** to begin the testing cycle. The word Passed will appear next to each test that is successful. To repeat the testing cycle, press **Alt-R** and select the number cycles you'd like to test. If the card fails the Peer-to-Peer, Ping, or Bandwidth tests, any network problems that you are experiencing are external to the card. Check your cabling and hub connections. If the card fails the Loopback or Register tests, check your computer's settings, then contact Linksys Customer Support for help.

Starting Over in Windows

Installing Windows Network Components from Scratch

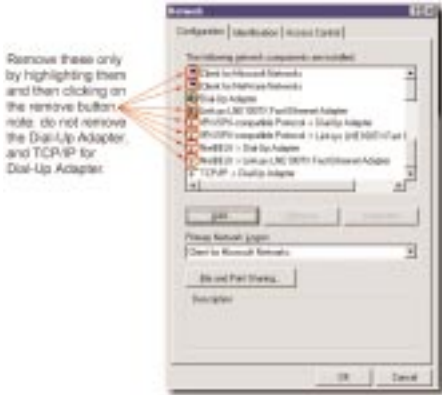
If you experience installation difficulties, you may need to re-install all of the Windows networking components from scratch. The instructions below explain how to give your PC a clean sweep so that you can start the EtherFast Card's software installation over.

1. At the desktop click on the **Start** Button, highlight **Settings**, click on **Control Panel**.
2. Double-click on the **Network** Icon.
3. Look at the box with the text that reads, The following network components are installed.
4. If the box has a component called Dial-Up Adapter, skip forward to step 6. If it doesn't, go to step 5.
5. Remove any instance on the name Linksys in the box. This includes *IPS/SPX...Linksys*, *NetBEUI...Linksys*, and *TCP/IP...Linksys*. Also remove *Client for Microsoft Networks*, *Client for Netware Networks*, and *File and Printer Sharing for Microsoft Networks*.



In some cases, removing one of these components may in turn automatically remove other components as well.

6. For PCs with Dial-Up Networking and/or an AOL adapter, remove any instance of the name Linksys, all IPX/SPX protocols, all NetBEUI, all Clients, and File and Printer Sharing for Microsoft Networks. Do **not**

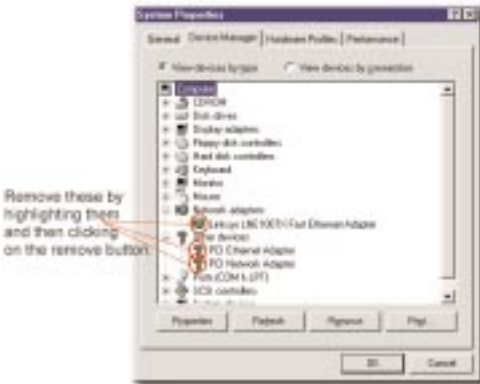


remove *Dial-Up Adapter, AOL Adapter, TCP/IP-Compatible Protocol-AOL Adapter* or *TCP/IP-Compatible Protocol-Dial-Up Adapter*.

7. When you are done removing all the unnecessary components, click **OK**. When asked to restart, click **No**.

8. Return to the Windows Control Panel. Double-click on the **System** Icon. The System Properties window will appear. Click on the **Device Manager** Tab.

9. Scroll down to the item Network Adapters and expand it by clicking on the **plus** [+] or **minus** [-] sign next to it.



10. Remove all devices with the name Linksys in it's description. (If at any point you are asked to restart the computer, Click **No**).

11. Scroll down to the Other Devices section. Remove *PCI Ethernet Controller* or *PCI Ethernet Adapter*. (If Other Devices is not listed, proceed to the next step.)

12. When you're finished, click on the **Close** button, shut down Windows, and restart your computer.

13. After your computer has restarted, turn to page 11 for Windows 98 or page 18 for Windows 95 and follow the setup instructions.

Manually Installing the Network Components in Windows

There may be times when you might need to manually install missing Windows networking components.

1. Click on **Start, Settings**, then **Control Panel**.
2. Double-click the **Network** icon. The Network window appears.
3. Click on the **Configuration** tab. Make sure that the following network components are installed:

Client for Microsoft Networks

Client for Netware Network

Linksys LNE100TX Fast Ethernet Adapter

IPX/SPX-compatible Protocol

NetBEUI



There may be other components listed in addition to the ones shown above. If any of the above components are missing, add them as follows:

Client for Microsoft Networks

If you plan on connecting to an NT file server or peer-to-peer network, click on the **Add** button. Highlight *Client* and click on **Add**. In the Network Client box, highlight *Client for Microsoft Networks* and click **OK**.

Client for Netware Networks

If you plan on connecting to a Novell NetWare workstation, click on the **Add** button. Highlight *Client* and click on **Add**. In the Network Client window, select *Manufacturer* and choose **Microsoft**. Click **OK**.

IPX/SPX-compatible Protocol

Click on the **Add** button. Choose *Protocol* and click on the **Add** button. Select *Manufacturer* and choose **Microsoft**. Under the Network Protocol box, highlight *IPX/SPX-compatible protocol*. Click **OK**.

NetBEUI

Click on the **Add** button. Select *Protocol*, then click on **Add**. Under *Manufacturer*, highlight **Microsoft**. Under *Network Protocol*, highlight **NetBEUI**. Click **OK**.

4. If you had previously attempted to install the EtherFast 10/100 LAN Card under Windows, please return to the setup now. Go to page 13 for Windows 98 and page 21 for Windows 95 and follow the instructions

LEDs

LNE100TX EtherFast 10/100 Network Card

LINK	The card has been successfully connected to a live port on a hub or switch
ACT	Denotes the card's activity. Network packets are being transmitted or received when this LED is flickering
100	When ON, the card is operating at 100Mbps When OFF, the card is operating at 10Mbps
FDX	When ON, the card is operating at a maximum throughput of 200 or 20Mbps; When OFF, the card is operating in half duplex at a speed of either 100 or 10Mbps

EFAH05W EtherFast 10/100 Auto-Sensing 5-Port Workgroup Hub

POWER	Indicates that the hub is receiving power.
100/10COL	Indicates if collisions are being encountered at 100Mbps and/or 10Mbps.
100	ON if a given port is operating at 100Mbps; off if the port is running at 10Mbps.
LINK/ACT	ON or flickering if a given port is sending or receiving data; off if the port is not connected to a node.
SW	ON if uplink port is in 100Mbps/100 meter Distance Extender mode. All connections on the hub must be running at 100Mbps.

Specifications

Model	10/100 Network In a Box
Part No.	FENSK05
Standards	IEEE 802.3, IEEE 802.3u, PCI 2.1, 2.2, ACPI
Card Bus Type	32-bit PCI
Modes	Half and Full Duplex Cards: Full Duplex 200/20Mbps Hub: Half Duplex 100/10Mbps
WOL Support	Remote Wake-Up (high and low power), Power Management Event
Ports	Cards: 1 RJ-45 Dual-Speed 10/100 Hub: 5 RJ-45 Dual-Speed 10/100
Cabling	
10BaseT	Category 3 or 5 UTP/STP
100BaseTX	Category 5 UTP/STP
Card Dim.	5" x 2.3" x .75"
Card Weight	2.5 oz.
Hub Power	5V 1.5A
Op. Temp.	0° to 55° C
Op. Humidity	10% to 85% non-condensing
Hub Dim.	7.5" x 5.4" x 1.4"
Hub Weight	0.9 lbs.

Customer Support

For help with the installation or operation of your EtherFast 10/100 LAN Card, contact Linksys Customer Support at one of the phone numbers or Internet addresses below.

Customer Support	949-261-1288
Fax	949-261-8868
Bulletin Board	949-261-2888 (33.6K, 8-N-1)
Email	support@linksys.com
Web	http://www.linksys.com
FTP Site	ftp.linksys.com



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